

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**
(PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/US2004/036667

International filing date (day/month/year)
03.11.2004

Priority date (day/month/year)
04.11.2003

International Patent Classification (IPC) or both national classification and IPC
C23C14/56, C23C14/30, H01L39/24

Applicant
SUPERPOWER, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized Officer

Teppo, K-M

Telephone No. +49 89 2399-8130



**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/036667

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/036667

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	2-42, 52-65
	No: Claims	1, 43-51, 66-68
Inventive step (IS)	Yes: Claims	52-65
	No: Claims	1-51, 66-68
Industrial applicability (IA)	Yes: Claims	1-68
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V.

1. The following documents are referred to in this communication:

D1 : PATENT ABSTRACTS OF JAPAN vol. 007, no. 201 (C-184), 6
September 1983 (1983-09-06) & JP 58 100676 A (MATSUSHITA DENKI
SANGYO KK), 15 June 1983 (1983-06-15)
D2 : US 2003/157742 A1 (HONDA KAZUYOSHI ET AL) 21 August 2003 (2003-08-
21)
D3 : US 2002/081371 A1 (CHEONG DAN DAEWEON) 27 June 2002 (2002-06-27)
D4 : EP 0 468 488 A (MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD) 29
January 1992 (1992-01-29)

2. Document D1 discloses a vacuum vapor deposition device for tape like substrates. The ferromagnetic material in a vapor source vessel 5 held in a vacuum depositing chamber 11 is heated with electron beams and evaporates at a specified rate. The vapor is deposited on a tape-like polymer substrate under winding. Upon completion of the vapor deposition, a gate valve 17 partitioning the chamber 11 and a containing chamber 16 is opened, and the vessel 5 is transferred into the chamber 16, then the valve 17 is closed and the vessel 5 is maintained of temp. with an electron gun 19. During this time, the vacuum in the chamber 11 is broken and the preparation for the next vapor deposition is made; thereafter the valve 17 is opened, the vessel 5 is returned to the home position, the valve 17 is closed and the vapor deposition is resumed. With such device, many times of vapor deposition are executed repeatedly, whereby efficiency is improved and the films of high purity are obtained without dissipation of impurities from the vessel 5. Thus, there are at least two electron beam deposition sources and it is possible to extend the life, (i.e. it is in-process repairable), of the other one (19), since it is isolated from the main deposition chamber.

2.1 INDEPENDENT CLAIM 67

As can be seen from the above, document D1 discloses in combination all the features defined in independent claim 67. Hence, the subject-matter of this claim is not new (Article 33(2) PCT).

2.2 INDEPENDENT CLAIM 43

As can be seen from the above, document D1 discloses in combination all the features defined in independent claim 43. The applicant should note that claim 43 is only limited to an e-beam deposition source that is in-process repairable and it is NOT limited to the tape-manufacturing system features.

Hence, the subject-matter of this claim is not new (Article 33(2) PCT).

2.3 DEPENDENT CLAIMS 44-51

Dependent claims 44-51 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT). The subject-matter of these claims is either disclosed in D1 or considered to be generally known to the person skilled in the art and thus obvious.

2.4 DEPENDENT CLAIMS 52-64

The subject-matter of claim 52 could be provisionally regarded as novel and inventive. None of the available prior art documents discloses electron beam deposition source, wherein it is specified how the deposition source is enabled to be in-process repairable.

3. Document D2 discloses a method and apparatus for coating a tape-like substrate, having at least two juxtaposed electron beam deposition sources capable of creating an enlarged deposition zone, there is also an assist source (e.g. UV source (7)) available. (see fig. 24 (24) and (16); pages 15-16, paragraph [0213].

3.1 INDEPENDENT CLAIMS 66 and 68

As can be seen from the above, document D2 discloses in combination all the features defined in independent claims 66 and 68. Hence, the subject-matters of these claims are not new (Article 33(2) PCT).

The methods claimed in claims 66 and 68 are only directed a method for coating at least one tape substrate. Whether the electron beam deposition sources are in-process repairable or not makes no difference to the novelty of the method claimed, since the in-process repair process itself is not claimed in these claims.

3.2 INDEPENDENT CLAIM 1

As can be seen from the above, document D2 discloses in combination all the features defined in independent claim 1. Hence, the subject-matter of this claim is not new (Article 33(2) PCT).

3.3 DEPENDENT CLAIMS 2-42

Dependent claims 2-42 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step (Article 33(2) and (3) PCT). These claims list merely features generally known or features that are regarded as standard modifications to the person skilled in the art of electron beam deposition and do not offer any special technical advantages over the available prior art. Moreover, document D3 discloses a multiple source deposition source with many electron beam deposition sources with standard monitoring and controlling devices (see page 4, paragraph [0051] and figure 2). Hence, the person skilled in the art would combine documents D1 and D2 without the need for the use of inventive skill.

4. INDEPENDENT CLAIM 65

- 4.1 Document D2 (see above) is considered to represent the most relevant state of the art, in respect of claim 65.

From this, the subject-matter of independent claim 65 differs in that there are at least two in-process repairable e-beam deposition sources and a controller in the tape-manufacturing system of current claim 65.

- 4.2 The subject-matter of claim 65 is therefore novel (Article 33(2) PCT)

The problem to be solved by the present invention may be regarded as how to provide an improved tape-manufacturing system with electron beam deposition sources having increased lifetime.

- 4.3 The solution to this problem proposed in claim 65 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

With in-process repairable sources increased production throughput is achieved and unnecessary shut-downs can be avoided.